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**THEORETICAL AND METHODOLOGICAL BASIS OF ADVANCED PROFESSIONAL TRAINING
FOR SECONDARY VOCATIONAL EDUCATION SPECIALISTS**

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Abstract

The relevance of the study lies in the importance of adopting innovative solutions for further evolution of the Russian System of SVE. The article is aimed at the development of theoretical and methodological grounds for advanced professional training of SVE specialists. The creation of educational and production clusters will provide professional resources for SVE organizations, resulting in the advanced approach in the vocational training in interaction with social partners. Using the comparison method, the study analyzes the experience of implementing public-private partnership programs in the sphere of SVE in Russia. The analysis revealed that the motivation of social partners to interact with vocational education institutions increases with the competition growth and is considered as a way to diversify production and business risks, as well as to reduce the costs for personnel training (retraining, advanced training). The analysis of the educational and production clusters functioning experience in experimental sites of leading educational organizations of SVE in the Siberian Federal District made it possible to identify and describe wide changes in the system of SVE, stages of implementing the mechanism for creating the system of advanced professional training for specialists with SVE, educational technologies required to

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organize the educational and production process, as well as conditions for the creation and implementation of the complete educational and production process in the SVE system.

Keywords

Advanced vocational education – Partnership in education – Innovative educational technologies

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Introduction

National educational systems correspond to different philosophical, cultural, political and socio-economic traditions, goals and objectives. The changing of these goals and objectives, and the need to preserve the existing traditions or to create new ones actualize the search for modernization directions of educational systems in general or of their individual components¹.

The process of the socio-economic development of the country is characterized by various innovations in education, including the creation of different clusters-complexes aimed at the integration and concentration of enterprises, scientific institutions and educational organizations in one territory. The Russian system of SVE (which in recent years has undergone significant structural and substantial reforms aimed at improving the quality of specialists' training in new socio-economic conditions) requires the adoption of innovative solutions².

A special role in modernizing the SVE system should be given to educational and production clusters, since it is in their context that educational organizations and their social partners are able to interact in real socio-economic conditions. Such interaction will allow effectively solving both the organization issues of training and practice of future specialists, as well as the issues of forming and changing the content component of vocational training and retraining, which in turn will promote the concept of personnel advanced professional training³.

Today the problem of advanced professional training is conditioned by the fact that SVE organizations do not have time to reform in response to dynamic changes in the demands of the labor market for a number of reasons, including:

- the heads of educational organizations lack the understanding of the nature and consequences of the socio-economic processes in the context of globalization and informatization, and this calls for a fundamental rethinking of the mission, tasks and responsibilities of educational organizations to graduates and the state;
- the heads of educational organizations lack clear understanding of the interaction mechanisms between educational organizations and social partners in solving problems of specialists' training and retraining, in particular, arranging a dialogue on mutually beneficial issues for modernizing the content of vocational training with an orientation to the requirements of modern production, taking into account the production development prospects, the organization of effective practice in real production and further graduates'

¹ T. M. Kagakina, "The main directions for modernization of the Russian university education", The Kemerovo State University of Culture and Arts, num 29-2 (2014): 171-177.

² G. N. Zhukov & M. P. Palyanov, Under the general editorship of I. I. Sokolova, Preparing future masters and teachers of vocational training within the system of continuous professional and pedagogical education. In the collection: Pedagogical education in the CIS member states: modern problems, concepts, theories and practice. Materials of the VII International Scientific and Practical Conference, 2014 y E. A. Pakhomova; V. A. Ovchinnikov; M. P. Palyanov; I. D. Lapteva; V. L. Bibik & M. V. Morozova, "Interrelation of vocational education and youth employment in Western Europe and Russia", Vocational education in Russia and abroad, num 3 (15) (2014): 6-13.

³ V. Y. Sinenko; M. P. Palyanov; I. V. Sirmolotov; R. F. Mukaev; O. A. Masyukov & N. V. Kharina, "Educational and industry cluster as an instrument of specialists' professional training", The Siberian teacher, num 2 (111) (2017): 5-11.

employment. The absence of such interaction aggravates the problem of graduates' employment in conditions of objective and inevitable changes in the structure of employment;

- the socio-economic situation in the regions, when technical schools and colleges opened in the twentieth century to meet the needs of certain industrial productions now lost their demand, either because of closure or re-profiling of these industries or because of material and technical inconsistency with new requirements of production workers⁴.

The aim of the research is to develop theoretical and methodological foundations for advanced professional training of SVE specialists with the justification of the interaction of the SVE organizations with general and higher educational organizations, institutions of advanced training and professional retraining, employers, state and business structures⁵.

To realize the goals set, the following tasks should be solved:

1. Developing the theoretical and methodological grounds to organize advanced training for SVE specialists with professional competencies in accordance with the requirements of innovative production, equipment and technologies.

2. Developing a leveled system for assessing students' achievements in advanced vocational training that contributes to individual professional development.

3. Developing scientific and methodological materials, programs, recommendations for teachers and social partners to improve the effectiveness of students' professional self-determination in continuing professional education.

4. Creating experimental sites in the regions of the Siberian Federal District on the basis of SVE organizations as centers for conducting experimental work to introduce theoretical and methodological foundations for the model of advanced training of SVE specialists' (Novosibirsk, Barnaul, Kemerovo, Novokuznetsk, Omsk, Tomsk, Uray), the Amur Region (Blagoveshchensk)⁶.

5. Elaborating an additional professional development program 'Advanced training of pedagogical specialists in the sphere of SVE' and upgrading the skills of teachers and production instructors at SVE Institutions on the basis of pilot sites.

Methodological framework

Today there is no unambiguous definition of such concepts as 'advanced continuous education', 'specialists' advanced training', 'advanced vocational education', etc., since this topic periodically appears or disappears in official documents. Systematic scientific research of this problem is insufficient. Therefore, we confine ourselves to a

⁴ T. B. Pankratova; M. P. Palyanov; A. R. Demchenko & V. I. Lebedev, "Networking of higher education institutions and employment services", Higher education in Russia, num 7 (2012): 139-148.

⁵ V. V. Abaturova; A. R. Demchenko; E. Y. Lukina; V.G. Lysenko; M. V. Morozova; M. P. Palyanov; E. A. Pakhomova; E. L. Rudneva; Y. P. Sergienko & V. Y. Sinenko, Continuous education and professional self-determination of students in the labor market (Novosibirsk, 2015).

V. Y. Sinenko; M. P. Palyanov; I. V. Sirmolotov; R. F. Mukaev; O. A. Masyukov & N. V. Kharina, "Educational and industry cluster as an instrument of specialists' professional training", The Siberian teacher, num 2 (111) (2017): 5-11.

⁶ S. V. Ivanova; E. A. Pakhomova; M. P. Palyanov & E. L. Rudneva, "Vocational education and youth employment is a global problem of the 21st Century", Pedagogy, num 8 (2013): 43-51 y M. P. Palyanov; E. A. Pakhomova & I. D. Lapteva "Youth employment and its regulation as a pedagogical problem", Pedagogy, num 9 (2014): 34-40.

review of the concept 'advanced education' presented in various publications⁷, treating it as "... education that ensures the accelerated development and self-development of trainees", forming the adaptability to rapidly changing economic, production and social requirements. It should be noted that the adaptability and professional development of the future specialist will be more successful when using personal development approach, as indicated by most researchers.

Accelerated personality development occurs in case of a clearly expressed need for self-development and self-realization in the profession, which is self-actualization of the personality⁸. Self-actualization of the personality is a conscious practical activity aimed at solving professionally oriented tasks. Innovative activities can serve as conditions for achieving needs and motives for self-actualization. Therefore, as a working concept, the authors suggest using the definition of 'advanced vocational education' as a system-forming vocational education realized in the interaction of all the components of the pedagogical system, built on the basis of innovative processes aimed at the professional development of future specialists, and its readiness for innovative professional activity.

Signs of 'anticipation' in this case are the construction of an innovative pedagogical process and the future specialist's readiness for innovative professional activity.

Based on this definition, the notion of 'advanced vocational training' can be formulated as the implementation of advanced vocational education in the professional activity of a specialist, supplemented by innovative changes (high-tech equipment, changed production relations, new forms and methods of work, etc.). Thus, the qualified activity of a specialist is supplemented by a certain innovative content which reflects something new that appears in the field of professional activity not yet reflected either in the Federal State Educational Standards (FGOS) or in educational and discipline programs. This new content is 'dictated' by the employer, and the educational organization should include it in the content of the educational program.

Theoretical and methodological foundations of SVE specialists advanced training presuppose a change in the attitude towards a person as a value, the subject of their activity carried out in conditions of constant updating of technologies, changes in the social and economic life, the need for the worker to master new types of professional activity, and the level of professional training.

In the study, the authors proceed from the understanding that the system of secondary vocational education specialists' advanced training should be based on the following paradigms:

1. Orientation to advance, in other words, the level of vocational education should outstrip today's production needs.

⁷ E. F. Zeer, Psychology of professions. University student's textbook. 2nd ed., revised., ext. Akademicheskij Proekt Publ., Moscow (Ekaterinburg: Delovaya kniga, 2003); A. M. Novikov, "Principles of constructing a system of continuous professional education", Pedagogy, num 5 (2005): 11-19 y P. N. Novikov & V. M. Zuev, Advanced vocational education (Moscow: Russian Academy of Labor and Employment, 2000) y

⁸ A. M. Novikov, "Principles of constructing a system of continuous professional education", Pedagogy, num 5 (2005): 11-19.

2. Socio-economic responsibility, i.e., the educational organization understanding their mission to ensure the socio-economic development of the region or state through solving the problems of qualitative, timely training of a sufficient number of staff with necessary profiling and qualifications.

3. Strive for self-development, meaning that the educational organization and its graduates are able and ready to improve personally and professionally in life.

4. Flexibility – educational organizations of general, secondary and higher education provide accessibility, multi-level system, integrability, maneuverability and relevance of educational programs, which makes it possible for students to develop flexible individual training plans and to find possibilities for industrial practice and further employment.

The implementation of the main tasks of the project is possible with a comprehensive approach to the disclosure of historical and philosophical prerequisites and organizational and pedagogical conditions for the solution of the stated issue.

Complexity determines approaches to conducting research aimed at improving the quality of personnel training for the main branches of the Russian economy, the identification of psychological and pedagogical mechanisms for the formation of professional self-determination and the design of the professional development individual trajectory for future specialists, as well as advanced training of SVE managers and teachers.

The logic of the research methods is determined by the project implementation stages.

At the first stage (analyzing the problem development in the scientific and pedagogical Russian and foreign literature) in 2018, general scientific methods (analysis, comparison, analogy, deduction), as well as approaches and research methods accumulated by pedagogy and, in particular, comparative pedagogy, will be used. The main methods will be systematic and dialectical ones; this will help analyze models of personnel training for the main sectors of the Russian economy as for dynamically developing structures integrated into the educational system. At this stage the most important are the research approaches – systemic, comparative, and interdisciplinary. At the second stage (development of the concept of SVE specialists' advanced training and the implementation of the model) in the first half of 2019, along with general scientific methods (generalization, classification, synthesis, modeling) the empirical method will be used in collecting, accumulating and fixing information on the research materials, and the rational method will be used to interpret the collected facts and to create explanatory schemes for contrasting models of SVE specialists' advanced training. The historical approach and the principle of comparativism for the selection of materials containing the most important, typical and contrast features of models for advanced training of highly skilled personnel will be used. At the third stage (organizing and conducting pilot work on the approbation of the model for SVE specialists' advanced training) in the second half of 2019 and in 2020, sociological methods will be used: conversation, questioning, testing, pedagogical observation, rating, interview, conducting ascertaining and forming stages of practical and experimental work. The experimental method that allows verifying the effectiveness of the theoretical development and implementation of modern scientific approaches and new forms of acquiring professional competencies in implementing a model of SVE specialists' advanced training will also be applied.

A set of methods used in 2019-2020 will be justified by the obtained qualitative and quantitative indicators (the results of the project in 2018). Preference will be given to empirical methods, in particular, to the empirical-diagnostic experiment revealing the level of professional competencies of SVE participants of the project: students and teachers. The experiment allows testing the effectiveness of developed programs, forms of acquiring professional competencies and statistical methods.

In the analysis, the provisions will be theoretically substantiated and confirmed by experimental work due to the idea that in the current socio-economic conditions, SVE organizations and their graduates can be professionally mobile and able to develop only if they are effectively integrated into modern socio-economic processes, which in turn can be ensured by effective interaction between educational organizations and their social partners and business⁹.

Results and discussions

1. *Modern achievements in the field of vocational education.*

The scientific theoretical and methodological basis for an integrated SVE system advanced training should be established on modern achievements in the field of vocational education. The authors identified the following as relevant for the project:

- Creation of the network of advanced training and continuous upgrading of the SVE scientific, pedagogical and professional staff.
- Creation of the system of laboratories and faculties for specialists' advanced training in cooperation with universities and business structures.
- Formation of the complex of continuous training for specialists in the system 'school → technical school → university → postgraduate education'.
- Introduction of innovative educational and professional technologies that ensure the interaction of all participants in joint activities for advanced training of personnel for schools, SVE institutions, universities, enterprises, and employment centers.
- Formation of innovative centers on the basis of SVE organizations: multifunctional centers of applied qualifications, resource centers for advanced training of personnel for the main industries of the regions, creation of educational and production clusters.

Increasing competition between universities provides new opportunities, such as creation of scientific centers (in the regions of the Russian Academy of Education (RAE)) which allow concentrating the scientific and educational resources of the region and pedagogical science. The creation of RAE scientific centers in separate territories is a timely and well thought-out step for the joint solution of specific problems of the regions.

⁹ V. L. Bibik; M. V. Morozova & M. P. Palyanov, Under the general editorship of I.I. Sokolova, Applied Bachelor's degree as a stage of continuous education. In the collection: Pedagogical education in the CIS member states: modern problems, concepts, theories and practice. Materials of the VII International Scientific and Practical Conference, 2014; M. P. Palyanov; Y. P. Pokholkov; E. A. Pakhomova; E. A. Rudneva; V. L. Bibik; A. B. Efremkov; V. A. Ovchinnikov; Y. P. Sergienko; G. A. Pavlyuchkov; N. V. Chicherina; Y. V. Kalinyuk; L. A. Kholina; M. V. Morozova & A. R. Demchenko, Comprehensive theory and practice study of the continuous technical education: a regional aspect. Monograph (Yurga: The Yurga Technological Institute, 2015) y M. Palianov; O. Loyko; S. Druga & O. Park, "Modern Professional Education in the Global Society: Comparative Study", *Procedia - Social and Behavioral Sciences*, num 206 (2015): 464-468.

In the Kemerovo region, the work is under way to create the RAE scientific center on the basis of Kuzbass Regional Institute for the Development of Professional Education and the Institute for Pedagogical Research on the Aptitude of Children of the RAE, which are actively involved in the improvement of vocational education in the region and the development and implementation of the concept of the advanced vocational education in Siberia and the Far East.

2. *Creation of educational clusters.*

Solving the problems of SVE advanced training is impossible without infrastructure changes. For such transformations in the regions, the authors refer to the *creation of educational clusters*.

The main driving force for the formation and development of regional educational clusters are the regional executive authorities, including administrative and sectoral regional and local government. They show the greatest interest in the formation of such strategic partnerships between industrial, scientific and educational institutions, and organizations located within the region.

In numerous constituent entities of the Russian Federation, regional educational clusters are considered as the main tool for implementing integrated regional policies, for their sustainable social and economic development, and for supporting adequate interregional competitiveness and resource self-sufficiency.

The creation of regional educational clusters is a common practice of territories with a high concentration of large enterprises, scientific institutions and educational organizations. Yet what should be done for territories that are geographically remote from universities and scientific centers?

The authors of the project initiated the creation of an educational and sectoral cluster of the municipal level, established on the basis of the SVE institution – the Uray Polytechnic College which builds a prognostic model of the institution as a logistical (resource) center of a cluster type. Close cooperation of the college with one of the leading enterprises in Uray, LLC Uray Oilfield Equipment, whose policy is aimed at solving the problem of training qualified specialists in SVE institutions, as well as supporting the Uray Administration in the Khanty-Mansiysk Autonomous District of the Tyumen Region, allowed forming a municipal cluster and creating a Coordination Council, which includes representatives of the City Administration, enterprises, Uray Polytechnic College, Uray Education Department, as well as scientists – experts in vocational education from the cities of Kemerovo, Novosibirsk, Omsk, and Tomsk¹⁰.

3. *The mechanism implementation stages for creating a system of SVE advanced training in the region.*

The implementation of the mechanism for building a model for advanced professional training of specialists in SVE in the region includes the following stages:

¹⁰ M.P. Palyanov; M. A. Pevin; M. K. Romanchenko; I. V. Sirmolotov; L. A. Kholina & N. V. Kharina, "Innovative pedagogical technologies as a basis for advanced training in professional educational organizations", Vocational education in Russia and abroad, num 4 (24) (2016): 84-91.

Stage 1 – development of organizational and legal foundations of public-private partnership of professional educational organizations with enterprises of the real economy sector, general education organizations, scientific organizations, parents, regional and municipal authorities, health, education, culture, trade unions, the media and other social and professional groups.

Stage 2 – development of forms and methods for network interaction between participants in the process of SVE specialists' advanced training.

Stage 3 – development and implementation of the educational and production cluster as an effective form of advanced professional training for SVE specialists and the SVE students' aptitude development.

When developing all the stages for creating a system of advanced training for specialists, the organization of the educational and production process in the SVE institutions is of particular importance.

4. Conditions for a complete educational and production process in the SVE system.

The creation of a model for specialists' advanced training is impossible without the appropriate conditions that ensure a complete educational and production process.

The authors consider such conditions to be:

I. Substantial conditions (a wide range of professional modules, a multilevel system of qualifications, a practice-oriented direction of education, inclusion in production, and a dual system).

II. Activity conditions (meetings of students and representatives of different professions, internships, training in multipurpose career development centers, and compulsory practice for students in enterprises).

III. Estimation conditions (understanding the essence of the chosen profession, self-evaluation of professional choice, forming interest in the profession, responsible attitude to building career paths, ability to make independent decisions, diagnosing and monitoring the quality of education).

IV. Result conditions (professional portfolio, employers' recommendations, and list of additional professional modules, credit system and additional qualifications of students). The organization of the educational and production process in the SVE system is based on ideas of individualization and differentiation. In our opinion, the actual direction for advanced SVE students' training is identification and pedagogical support of gifted students in the SVE system.

5. Multilevel educational and methodical complex as advanced technology in the SVE system.

The need for research is related to the identification and pedagogical support for gifted students of the secondary vocational education system. As one of the new innovative directions, it found understanding and support in the Department of State Policy in the field of personnel training and continuous professional education of the Ministry of Education and Science of the Russian Federation. This proves the demand of selected areas of further research related to the development of the concept and methodological support for gifted students in the system of secondary professional and higher education.

The authors together with practitioners took steps to develop and implement multi-level educational and methodological complexes for SVE institutions, especially in technical and natural sciences directions (mathematics, physics, chemistry, biology, technology, computer science), including innovative technologies in training and production process of professional educational organizations, as well as the development of control, evaluation tools and measuring materials, approaches and methods of working with professionally gifted SVE students, and virtual and real information technologies of advanced development.

A multilevel educational and methodical complex consists of a basic textbook, a cycle of lectures, a workbook, a collection of multilevel tests on the subject in accordance with the level of complexity, an electronic textbook, a list of professionally-oriented Internet resources, multimedia modules with interactive exercises and simulators, a list of research projects, and methodical manuals for teachers¹¹.

The authors consider the creation of a multilevel educational and methodological complex in the structure of an educational and production cluster as a leading technology in the SVE system.

6. Educational technologies necessary for the organization of the educational and production process.

During the organization of the educational and production process, the high qualification of managers and teachers is not enough; specialists need a number of particular professional competencies and the mastery of educational and professional technologies.

Technologies in vocational education include theoretical training, laboratory and practical classes, graduation qualification works, a network form of educational programs, information and distance technologies, modular training technologies, a training and demonstration complex, training and production sites, practice-oriented training, production training, practice, project method and production tasks solution, universal skills, technologies of social partnership and the participation of professionals in training and production, simulation of manufacturing processes, and new innovative professional technologies, developed jointly with the Russian Academy of Sciences in the leading universities of Russia¹². The additional measures will be the use of network, information, distance technologies; changing the role of the teacher in the organization of advanced training of specialists; training engineers and teachers able to work and to implement complex tasks in practice, and not only possessing theoretical knowledge; assignments and exercises that provide professional and practical preparedness of graduates, and, of course, widespread technologies of cooperation between vocational education institutions and social partners.

¹¹ V. Y. Sinenko; M. P. Palyanov; D. N. Shekhovtsova; O. A. Masyukov & T. R. Zakirzyanov, "Multilevel educational and methodical complex as a tool for developing meta-subject competencies". *Siberian teacher*, num 6 (2017): 78-86.

¹² M. P. Palyanov; M. A. Pevin; M. K. Romanchenko; I. V. Sirmolotov; L. A. Kholina & N. V. Kharina, "Innovative pedagogical technologies as a basis for advanced training in professional educational organizations", *Vocational education in Russia and abroad*, num 4 (24) (2016): 84-91.

7. Cooperation of the SVE institutions with social partners.

The regional system of professional education is a field of joint activities of partners in the implementation of stated and agreed interests. It is characterized by the following integral components: a) public-private infrastructure which includes both public education authorities, SVE institutions and non-profit organizations (agencies, centers, private educational institutions, personnel departments of social partners – personnel customers, bureaus, services), ensuring the coordination of supply and demand for educational services and competencies (qualifications) of graduates; b) state educational programs and technologies for stationary training of students on the state assignment basis; c) social and educational programs and technologies of informal vocational education.

A key moment in improving the effectiveness of regional management of SVE is the delineation of interest groups and the development of a public-private mechanism for their harmonization and implementation.

The study identified the main approaches of public-private partnership in the field of vocational education:

- a) mutually beneficial and voluntary character of relations between partners;
- b) contractual amount of resources to achieve the results of joint activities;
- c) diversification of risks and costs to ensure mutual responsibility;
- d) authority of representatives of the parties in the management structures;
- e) written form of contractual relations with the mandatory determination of control procedures and sanctions for non-fulfilled obligations.

The typology of public-private partnership in the regional vocational education model is determined by the socio-economic situation in the region and allows solving the most common problems: finances, investment, property, outsourcing, marketing, insurance, which lets ensure the quality, accessibility and effectiveness of SVE for different age groups of consumers.

The analysis of foreign experience of the public-private partnership in the sphere of SVE established that the motivation of social partners to interact in the vocational education sphere increases with the growth of competition, as a way to diversify risks and reduce the costs of staff training (retraining, advanced training). A set of methodological support for various types of vocational training (training, professional practice, certification on the level of qualification, coaching, diploma projects, etc.) is developed by sectoral agencies at the Chamber of Commerce, recording and entering into force for a new area of expertise. Upon completion of training, the methodological support package is submitted to the data bank of the industry agency (Denmark's experience). Practical training (internship) is introduced (as the most expensive component of vocational education) at the possibly later stages, after the selection of the most motivated among students (the experience of the United States and Great Britain). In particular, the experience of Sweden and the United Kingdom shows that the traditional partnership scheme 'the establishment of vocational training → the company' in the economic crisis must be transformed into the creation of a 'network interaction' with the participation of industry vocational training institutions, chambers of commerce, and alumni associations. Thus, the modern regional model of vocational education is not characterized by the viability of its markets but by the effectiveness of its networks. Leading institutions of professional education on the basis of

public-private partnerships are included in the educational and sectoral clusters, aimed at solving the problems of the regional industrial business.

The leading method of research in determining theoretical and methodological grounds for SVE specialists' advanced training was the analysis of Russian and foreign experience of public-private partnership in the SVE sphere¹³.

An international cooperation is needed in the development of the model for specialists' advanced training. At the first stage of the study, a list of countries, educational and scientific organizations with already existing permanent links, including participation in joint events, conferences, exhibitions, publications, is established. These are: the Republic of Kazakhstan (Academy of Pedagogical Sciences of Kazakhstan, al-Farabi Kazakh National University, Almaty State Polytechnic College, College of Business and Service Management Education of East Kazakhstan region), Germany (Hochschule Neubrandenburg (Institute Neubrandenburg), and China (Heihe University)¹⁴.

As one of the cooperation areas in the process of SVE specialists' advanced training, the Institute for Pedagogical Studies of the Aptitude of Children of the RAE offers the research on the development problems of SVE students' aptitude, which has already received support in the framework of the State program of the Ministry of Education and Science of the Russian Federation.

A number of leading SVE institutions in Siberia demonstrated successful experience of public-private partnership and network interaction, for example: Siberian Polytechnic College (Kemerovo), Novosibirsk College of Building and Mounting (Novosibirsk), Novosibirsk College of Car Service and Road Facilities (Novosibirsk), Professional College of Novokuznetsk (Novokuznetsk), Yurga Technological College (Yurga, Kemerovo Region), Uray Polytechnic College (Uray, Khanty-Mansi Autonomous District of the Tyumen Region), Altai Academy of Hospitality (Barnaul, Altai Krai), Tomsk College of Railway Transport (a branch of the Siberian State Transport University, Tomsk).

These educational institutions are professionally mobile, ready to participate in the implementation of the project, and able to ensure the reliability of research results for a number of reasons:

¹³ M. P. Palyanov & L. A. Kholina, "Actual tendencies of interaction between vocational education institutions and the professional community", *Almanac of world science?* Num 1-3 (1) (2015): 36-40; M. P. Palyanov; R. Zinser & E. I. Pecheritsa, Comparative analysis of the Russian and American youth training for employment in the labor market. In the collection: *Vocational Education and Youth Employment: the 21st Century. The system of professional education in conditions of modernization, 2014* y E. A. Pakhomova; V. A. Ovchinnikov; M. P. Palyanov; I. D. Lapteva; V. L. Bibik & M. V. Morozova, "Interrelation of vocational education and youth employment in Western Europe and Russia". *Vocational education in Russia and abroad*, num 3 (15) (2014): 6-13 y I. P. Smirnov; E. V. Tkachenko; T. Koshmanova; L. A. Kholina; E. L. Rudneva; Y. P. Sergienko; R. Zinser; E. Targovski; M. P. Palyanov & S. V. Ivanova, Edited by E. V. Tkachenko and I. P. Smirnov, *Theory and practice of vocational education modernization in Russia and the USA. International collective monograph* (Tomsk, Kemerovo, Novosibirsk, 2012).

¹⁴ V. Y. Sinenko; M. P. Palyanov; D. N. Shekhovtsova; O. A. Masyukov & T. R. Zakirzyanov, "Multilevel educational and methodical complex as a tool for developing meta-subject competencies", *Siberian teacher*, num 6 (2017): 78-86.

- numerous years of experience in specialists' professional training according to the organization educational profile (chemical and information technology sectors, construction, car service and road facilities, modern IT technologies in education, development and operation of oil and gas fields, formation and development of entrepreneurial competencies of children and young people in the system of multi-level education, etc.);

- high rating among professional educational organizations included in the experiment for constructing the model of interaction between educational organizations and their social partners and business (the status of the leading professional educational organizations), the availability of innovative infrastructures in the management system of a professional educational organization (resource centers, Multifunctional Center of Applied Qualifications, modern educational, methodological and technical laboratories in accordance with the requirements of world standards WorldSkills, training sites, certified quality management systems, etc.);

- professional educational organizations effectiveness indicators at the level of the best Russian and foreign institutions of SVE (almost 100% graduates' employment, the availability of licenses for professions or specialties from the TOP-50, participants and winners of regional, national and international working professions championships WorldSkills Russia, etc.);

- innovative activities in the regions (the experience of organizing and conducting Russian and regional scientific and practical conferences, scientific and methodological seminars, including international participation, round tables, exhibitions, craft fairs, etc., published scientific and methodological articles and collections of publications, summarizing the experience of teams on the research topic);

- qualifications improvement and staff retraining (as an example, the retraining course of 25 teachers from Novosibirsk College of Car Service and Road Facilities in 2016-2017 on the topic of additional professional program 'SVE teachers' advanced training');

- five professional educational organization directors out of eight have a candidate of pedagogical sciences degree.

All this requires the development and implementation of new training and methodological complexes, innovative technologies, networking of educational organizations and business structures, the development of a regional model for SVE specialists' advanced training, the search for new tools and methods that stimulate the development of public-private partnership in SVE specialists' advanced training, which should be reflected in the project implementation plans.

8. System-wide changes in SVE.

The authors of the study include the following aspects in the system-wide changes in SVE:

- training quality improvement for SVE students with an orientation towards innovative technologies in the technical, economic and social spheres;

- international certification of educational vocational programs and educational institutions;

- steady increase in the professional employment of SVE graduates with a focus on constant career growth;

- formation of a positive students' attitude to work as a socially significant component of individual innovative development;

- expansion of students' views on promising scientific and technological directions and the technical level of innovative developments;
- students' vocational training level increase;
- students' innovative and entrepreneurial culture, design and research competencies increase;
- creation and improvement (on the basis of professional educational institutions) of specialized resource and applied qualifications centers, training sites, demonstration complexes, business incubators, participation in exhibitions, implementation of competitive works, joint researches and projects with university students and professors, etc.

Conclusion

Ideas for the implementation of the research project for personnel's advanced professional training find a special understanding and support among teachers. 22 educational organizations of the Siberian region (Altai Krai, Novosibirsk, Kemerovo, Tomsk, Omsk, Tyumen (Khanty-Mansiysk Autonomous District), the Krasnoyarsk Krai) and the Far East (Amur Region) are part of experimental sites ready to work on the project. The listed regions are represented in the project by educational organizations of secondary vocational education (technical schools, colleges) or higher education (universities, branches, retraining institutions), as well as general education (schools, lyceums, gymnasiums, boarding schools, additional education institutions), cooperating with SVE institutions.

The authors of the study refer to the following real positive achievements:

- proposals to improve the system of personnel's advanced training for the main sectors of the economy through the creation of educational and production clusters with a focus on constant career growth in the process of implementing basic priorities of Russia's scientific and technological development;
- multilevel programs, educational and methodical complexes in the following subjects: mathematics, physics, chemistry, technology, informatics, applied professional orientation, physical education, which provides advanced training of scientific and pedagogical professional personnel for the main branches of social and economic development of the regions; level system for assessing the students' achievements;
- additional professional development program 'SVE teachers' advanced training';
- special courses for undergraduates for the improvement of professional skills of Siberian region teachers (Kemerovo, Tomsk and Novosibirsk regions), 'Employment of young people and its regulation', 'Vocational education and self-determination of trainees', 'Methods and technologies of advanced vocational education for a changing regional labor market', etc.;
- scientific and methodological materials, programs, recommendations for teachers and social partners to increase the effectiveness of students' professional self-determination in the system of continuous vocational education;
- comprehensive program for the improvement of advanced development territories (ADT), introducing the educational and methodological complex of SVE specialists' advanced vocational training for the basic branches of innovative development of the Siberian and Far East regions;
- creation of centers for network interaction in the regions of the Siberian Federal District, implementing joint projects, conferences, internships, technologies of advanced training for professional personnel in the main branches of economic development for the Siberian and Far East regions, based on pilot sites.

One of the effective solutions for the problem of advanced training, according to the authors, is the SVE teachers' advanced training.

Therefore, in 2016 the temporary research team consisting of 6 doctors and 5 candidates of sciences from Novosibirsk, Kemerovo, Omsk, Barnaul, Tomsk, based in Novosibirsk Institute for Advanced Studies and Retraining of Education Workers, developed and approved an additional professional program 'SVE teachers' advanced training'.

The purpose of training was to expand and deepen the knowledge of students in the application of reasonable forms, methods, techniques, educational technologies of advanced training for specialists in SVE.

A special feature of the program was training specialists at their workplace, within their organization and without detachment from the training and production process. The training was conducted according to the approved schedule once a month during the academic year, ending with the graduation paper at the end of the academic year.

The authors of the study recommend transforming the best of experimental sites into pilot innovation sites of RAS, which will provide experimental work with scientific and methodological support of the leading scientists from relevant industries:

- opening in Kemerovo Region the Scientific Center on the basis of the Kuzbass Regional Institute for the Development of Professional Education for the research directions coordinated between the region and RAE, including this project;
- opening (based on the RAE), innovative pilot sites, including successfully developing professional education organizations of Kemerovo, Novosibirsk, Tomsk, Omsk, Amur regions, Altai Krai;
- determining the prospects for the international cooperation of the Siberian and Far East educational organizations (Kemerovo, Novosibirsk, Omsk and Amur regions, Altai Krai) with educational organizations of Germany, Kazakhstan, China and other countries, establishing the International Center for the Development of Concepts and Technologies for SVE Specialists' Advanced Professional Training.

The materials of the research are of practical importance for SVE organizations heads, where the specialists' training is carried out, or is planned on the basis of interaction with enterprises of real economy sector and general education organizations. The materials will be also useful for regional executive authorities, as most interested in building the effective partnerships between production, scientific and educational organizations of the region.

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